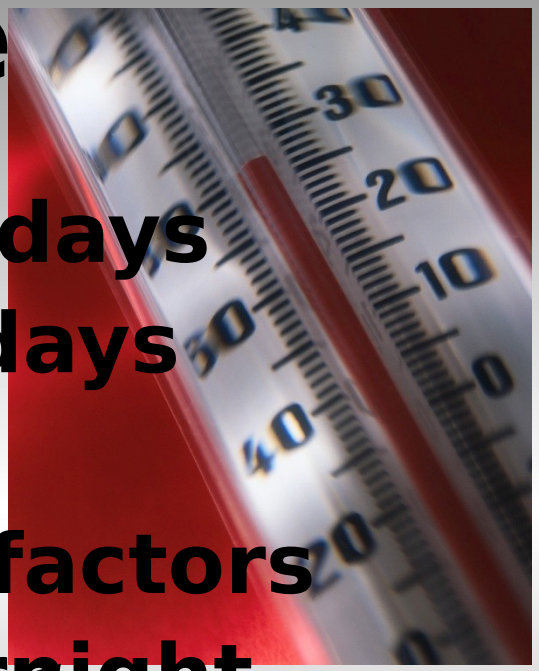
Heat Injury Prevention & Treatment

Heat Injury Hazards are Cumulative



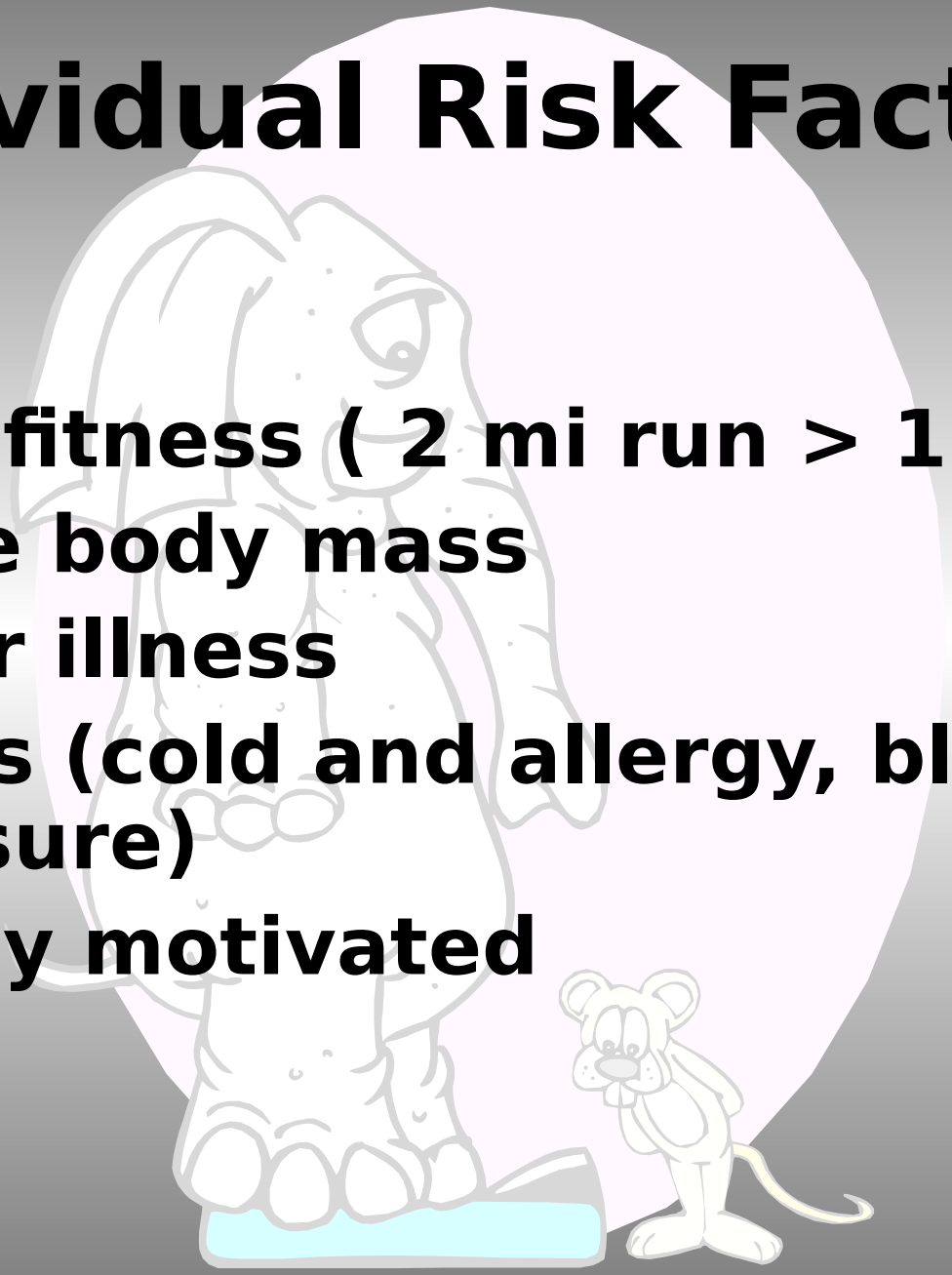
- **H- Heat category past 3 days**
- **E- Exertion level past 3 days**
- **A- Acclimation/**
  other individual risk factors
- **T- Temperature/rest overnight**

Cluster of heat injuries on prior

days= HIGH RISK

Individual Risk Factors

- Poor fitness (2 mi run > 16 min)
- Large body mass
- Minor illness
- Drugs (cold and allergy, blood pressure)
- Highly motivated



Individual Risk Factors

- Supplements- ephed
- Recent alcohol use
- Prior heat injury
- Skin problems- rash, sunburn, poison ivy
- Age>40

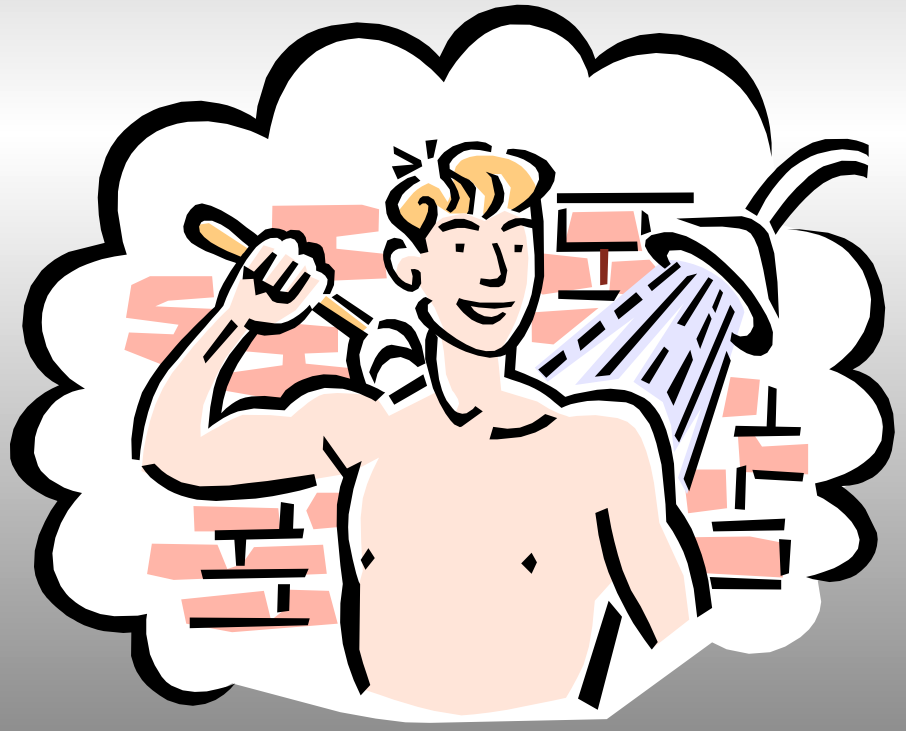
Risk Mitigation
Avoid Heat Loading

- **Modify schedule- time of day, rest**
- **Clothing-**
  Loose layers
- **Formations:**
  - **Wide spacing**
  - **Shade soldiers**

- **Cumulative- avoid strenuous back-to-back events**

Risk Mitigation
Dump Heat Load

- Cool overnight temp
- Cold showers



Develop Controls

- **Track Wet Bulb Globe Temp (WBGT)**
- **Track hydration of Soldiers**
- **Fluid replacement/ work/ rest guidelines**
- **Keep urine lemonade color (light yellow)**
- **All unit leaders must be familiar with heat injury prevention and recognition**
- **Know the Soldiers who are high risk**
- **Ensure water points accessible/ utilized**

Symptoms of Mild Injury

- Dizziness
- Headache
- Nausea
- Unsteady walk
- Weakness
- Muscle cramps
- These folks need rest, water, evaluation
- These are your "canaries in the mine"

Mild Heat Injury Management

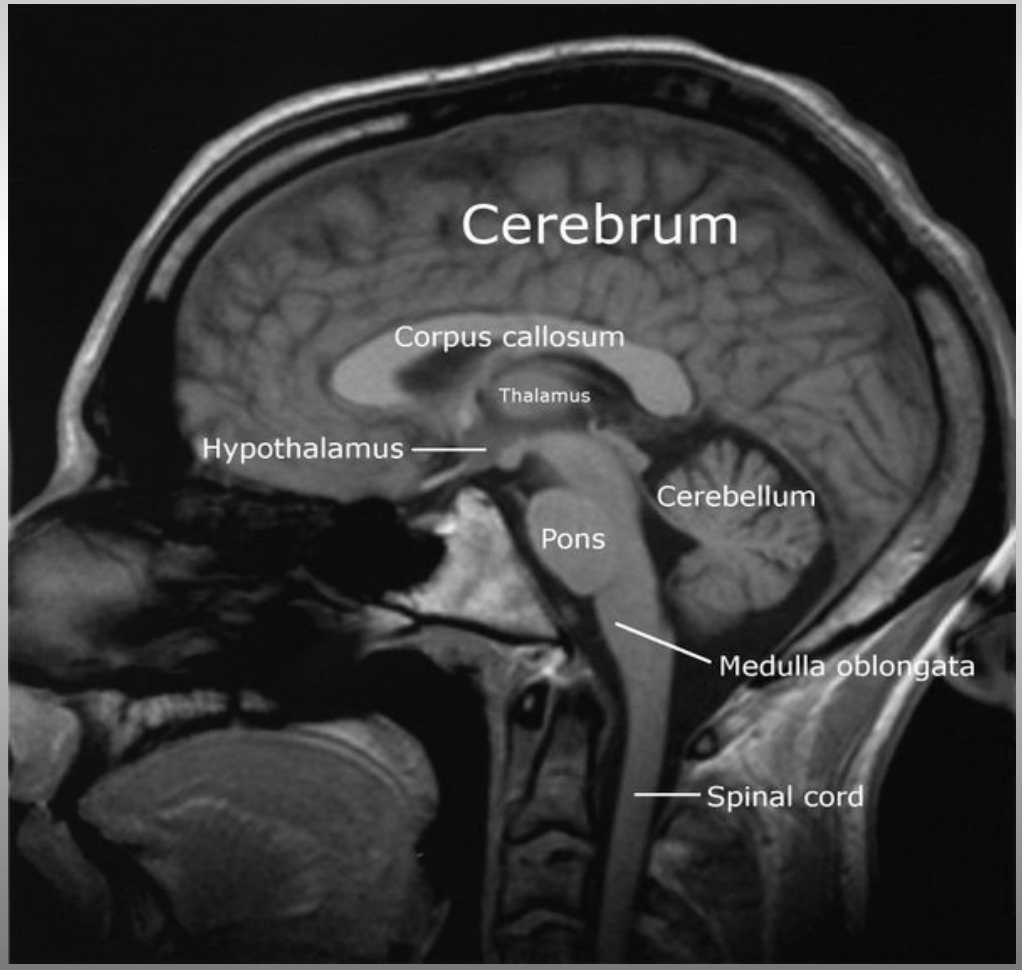
- **Rest Soldier in shade**
- **Loosen uniform/ remove head gear**
- **Have Soldier drink 2 quarts of water over 1 h**

- **Evacuate if no improvement in 30 min, or if Soldier's condition worsens**

Heat Stroke

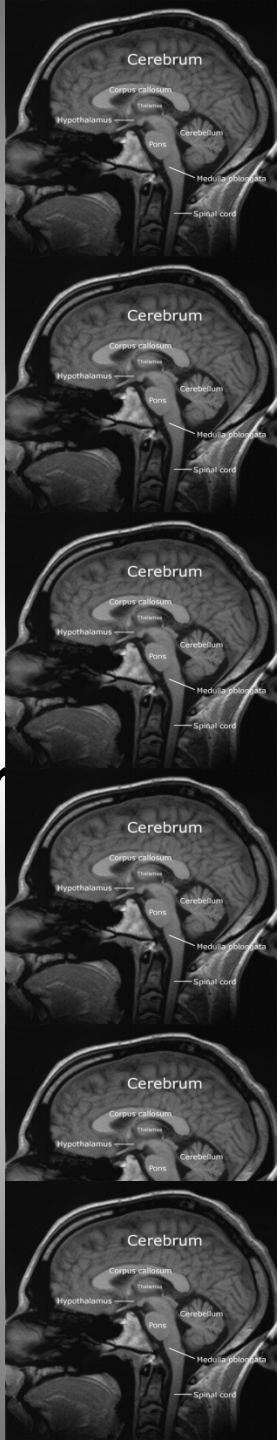
- Abnormal brain function- elevated body temperature

- Examples:
  - Confused
  - Combative
  - Passed out
  - Sudden death



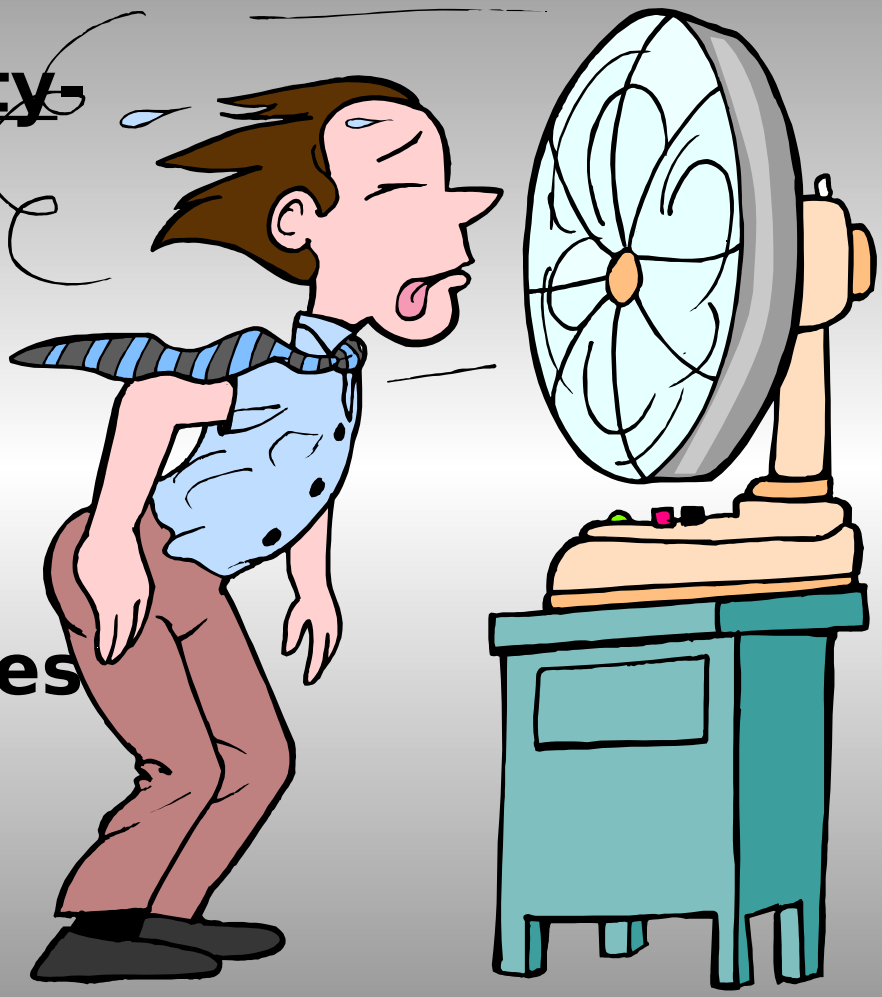
Heat Stroke

- **When a soldier's brain isn't working correctly- COOL and CALL**
- **Treat any soldier who develops abnormal brain function during warm weather activity as a heat stroke victim**
- **The sooner a victim with heat stroke is cooled, the less damage will be done to his brain and organs**



Pre-Hospital Care

- **<u>Cooling is first priority</u>- can reduce mortality from 50% to 5%**
- **Drench with water**
- **Fan**
- **Iced sheets**
- **Massage large muscles while cooling**
- **Stop if shivering occurs**



Work/Rest and Water Consumption Table

Applies to average sized, heat-acclimated soldier wearing BDU, hot weather. (See TB MED 507 for further guidance.)

Easy Work	Moderate Work	Hard Work
• Weapon Maintenance • Walking Hard Surface at 2.5 mph, < 30 lb Load • Marksmanship Training • Drill and Ceremony • Manual of Arms	• Walking Loose Sand at 2.5 mph, No Load • Walking Hard Surface at 3.5 mph, < 40 lb Load • Calisthenics • Patrolling • Individual Movement Techniques, i.e., Low Crawl or High Crawl • Defensive Position Construction	• Walking Hard Surface at 3.5 mph, ≥ 40 lb Load • Walking Loose Sand at 2.5 mph with Load • Field Assaults

Heat Category	WBGT Index, F°	Easy Work		Moderate Work		Hard Work	
		Work/Rest (min)	*Water Intake (qt/hr)*	*Work/Rest (min)*	*Water Intake (qt/hr)*	*Work/Rest (min)*	*Water Intake (qt/hr)*
1	78° - 81.9°	NL	½	NL	¾	40/20 min	¾
2 (GREEN)	82° - 84.9°	NL	½	50/10 min	¾	30/30 min	1
3 (YELLOW)	85° - 87.9°	NL	¾	40/20 min	¾	30/30 min	1
4 (RED)	88° - 89.9°	NL	¾	30/30 min	¾	20/40 min	1
5 (BLACK)	> 90°	50/10 min	1	20/40 min	1	10/50 min	1

- The work/rest times and fluid replacement volumes will sustain performance and hydration for at least 4 hrs of work in the specified heat category. Fluid needs can vary based on individual differences (± ¼ qt/hr) and exposure to full sun or full shade (± ¼ qt/hr).
- **NL** = no limit to work time per hr.
- **Rest** = minimal physical activity (sitting or standing) accomplished in shade if possible.
- ***CAUTION: Hourly fluid intake should not exceed 1½ qts.***

  Daily fluid intake should not exceed 12 qts.
- If wearing body armor, add 5°F to WBGT index in humid climates.
- If doing Easy Work and wearing NBC (MOPP 4) clothing, add 10°F to WBGT index.
- If doing Moderate or Hard Work and wearing NBC (MOPP 4) clothing, add 20°F to WBGT index.

For additional copies, contact: U.S. Army Center for Health Promotion and Preventive Medicine Health Information Operations Division at (800) 222-9698 or CHPPM - Health Information Operations@apg.amedd.army. mil.
For electronic versions, see http://chppm-www.apgea.army.mil/heat. Local reproduction is authorized.
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HEAT INJURY PREVENTION

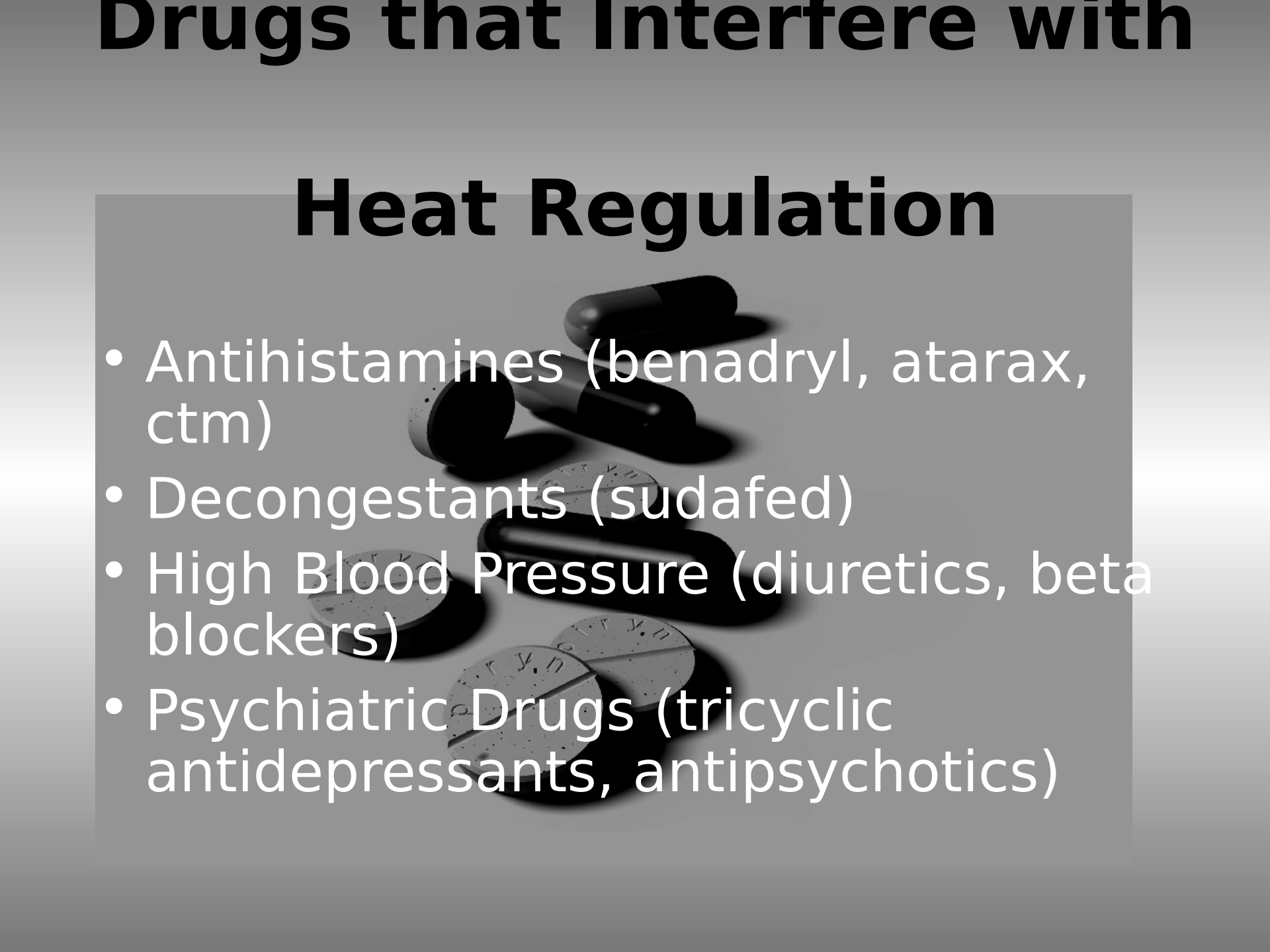
Fluid Replacement Guidelines for Warm Weather Training

(Applies to average heat acclimated soldier wearing BDU, Hot Weather)

Heat Category	WBGT Index, ^{0}F	Easy Work		Moderate Work		Hard Work	
		Work/Rest	Water Intake, Qt/hr	Work/Rest	Water Intake, Qt/hr	Work/Rest	Water Intake, Qt/hr
1	78-81.9	NL	1/2	NL	3/4	40/20 min	3/4
2 (Green)	82-84.9	NL	1/2	50/10 min	3/4	30/30 min	1
3 (Yellow)	85-87.9	NL	3/4	40/20 min	3/4	30/30 min	1
4 (Red)	88-89.9	NL	3/4	30/30 min	3/4	20/40 min	1
5 (Black)	>90	50/10 min	1	20/40 min	1	10/50 min	1

- The work rest times and fluid replacement volumes hydration volumes will sustain performance for at least 4 hours of work in the specified heat category. Individual water needs will vary approx ¼ qt or 8 ounces per hour.
- NL=no limit to work time per hour.
- Rest means minimal physical activity (sitting or standing), accomplished in shade if possible.
- **CAUTION: Hourly fluid intake should not exceed $1^{1/2}$ quarts.**
  Daily fluid intake should not exceed 12 quarts.
- Wearing body armor adds 5 degrees Fahrenheit to WBGT Index
- Wearing MOPP overgarment add 10 degrees Fahrenheit to WBGT Index.

Drugs that Interfere with Heat Regulation



- Antihistamines (benadryl, atarax, ctm)
- Decongestants (sudafed)
- High Blood Pressure (diuretics, beta blockers)
- Psychiatric Drugs (tricyclic antidepressants, antipsychotics)

Scenario
Awake Victim-
Muscle Cramps/Headache

- **Move to shade/ or air conditioning**
- **Remove outer layer of clothing/ headgear**
- **2 cante** **water over 1 hour**

Scenario
Awake Victim- Abnormal Behavior

- Move to shade
- Remove outer layer of clothing
- Call for evacuation
- Begin rapid cooling- iced sheets
- CLS qualified individuals may administer an IV after evacuation and cooling started

Water Intoxication

- Do not “Force Hydration”
- Mental status changes
- Vomiting
- History of large volume of water consumed
- Poor food intake
- Abdomen distended/bloated
- Copious clear urine